This technique provides an additional benefit for the transmission of messages. With judicial assignment of the attributes in terms of 1's and 0's, it is possible to transform a given target into one of the specially coded words shown at the top of Table 4--for example, an indoor swimming pool would be rendered as the code word 10101. These code words are carefully chosen [15] to construct an error-correcting block code of a type commonly used for signal transmission over noisy information channels.

Table 4

A 5-BIT DECODING MATRIX
(Two Information Bits, Three Parity Check Bits)

00000	01110	10101	11011	
00001	01111	10100	11010	Single Error Correction
00010	01100	10111	11001	
00100	01010	10001	11111	
01000	00110	11101	10011	
10000	11110	00101	01011	
00011	01101	10110	11000	Double Error Correction
01001	01111	11100	10010	
11000	11110	00111	01001	
	00111		00011	

To send one of four messages using our standard remote sensing protocol, an outbound team of experimenters chooses the message whose attributes match one of the four shown at the top of Table 4 and proceeds to a target location corresponding to that binary word. The subject and his monitor then conduct a standard remote viewing experiment. (The subject is encouraged to respond freely, and is discouraged from guessing with regard to the attribute list.) Once the response period is completed, a judge must form a single binary word from the subject's response, as described above. The judge then must find his "response" word somewhere in the decoding matrix shown in Table 4 and choose as his "message received" the word that tops the column in which the response word appears. By inspection of Table 4, one finds that the decoding matrix will correct for all single errors in attribute labeling, and will correct for some double errors.

$P_{0\,error} = .32768$

$P_1 = .4096$

$P_2 = .2048$

$P_3 = .0512$

$P_4 = .0064$

$P_5 = .00032$

$$P_{\sum_{i=1}^{5}} = (P_i)^5$$

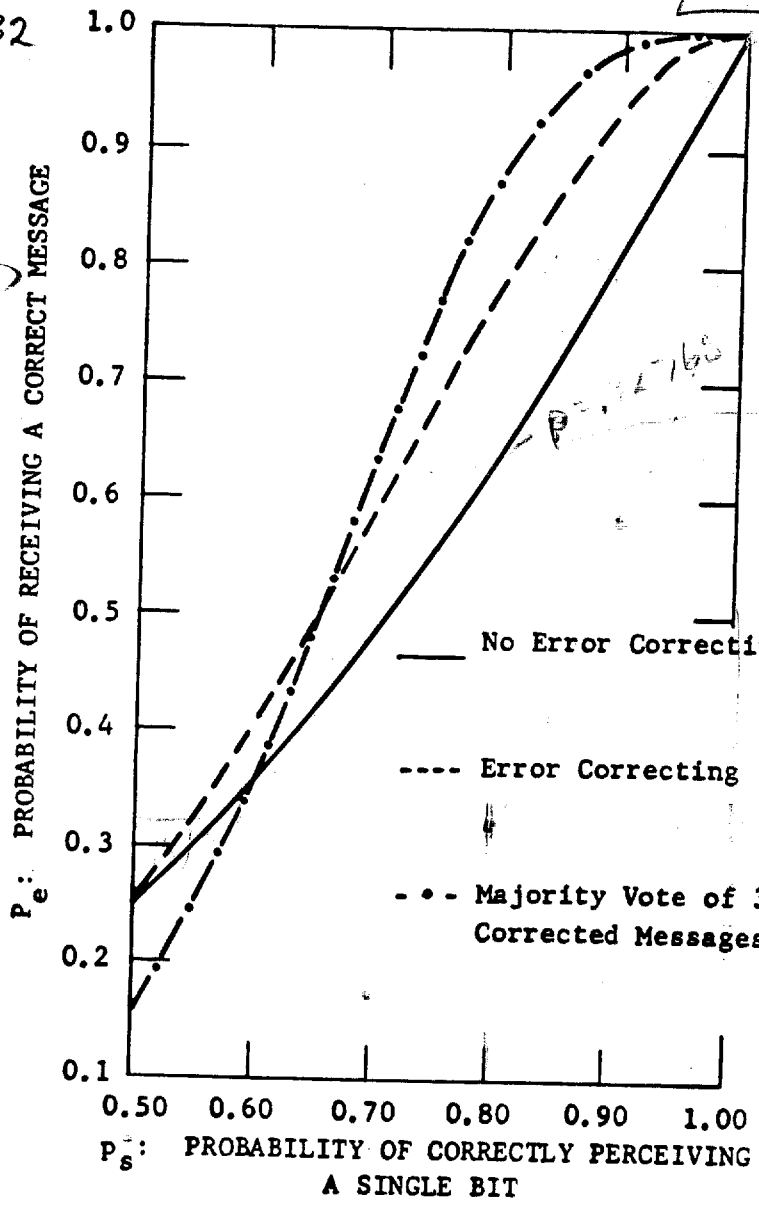
for $P_i = .8$

$P_{\text{perfect 5 bit message}} = .32768$

$P_{>2\ \text{error}(1\ \text{or}\ 0)} = .73728$

$P_{>3\ \text{error}(0,1,\text{or}\ 2)} = .94208$

$P_{<3\ \text{error}(3,4,\text{or}\ 5)} = .05792$



$P_i = .8$

$P_{2^5} = (.8)^5 = .32768$

.64
.8
.64
.8
256
384
.4096
.8
.32768

FIGURE 1 USE OF A 5-BIT ERROR-CORRECTING CODE TO INCREASE PROBABILITY OF CORRECT MESSAGE RECEPTION

Figure 1 shows the enhanced probability of receiving a message correctly over that expected if no error correction is used. The message reliability can be further enhanced by use of a majority vote of three such error-correcting experiments. The probability enhancement for this case is also shown in Figure 1. Pilot work has indicated that for the attributes shown in Table 3, the probability of a correctly received message approaches 95%. Another benefit of the procedure incorporating the additional majority vote feature is that in the absence of obtaining a majority vote (that is, in the absence of obtaining 5-bit responses which, at least two times out of three, lands in one of the four message columns of Table 4), one is certain that no message was received.

Experiments will be carried out to evaluate the proposed judging procedure. If successful, such a procedure will provide information on subject reliabilities with respect to various categories of response, and will thus be useful in assessing channel reliability.

b. Role of Feedback in Remote Viewing

In past programs we have conducted two series of experiments with experienced remote viewing subjects to determine the effects of withholding feedback. Both of these series failed to give a single successful outcome in the no-feedback condition. This result offers strong evidence that feedback is an essential element for successful remote viewing, whether the reasons be psychological or physical. The next appropriate series of experiments with these normally successful subjects is to intermix, on a random schedule, feedback and no-feedback trials, to eliminate any effect of psychological expectation that a subject might have with regard to a given trial being carried out without feedback. If we again find no success in trials without feedback, while the subjects continue to demonstrate successful remote viewing in those experiments with feedback, this would indicate that there was some substantive, perhaps physical, basis for the effect of feedback on the experiments.

c. Role of Consciousness (Computer-Controlled Experiments)

If it should turn out that the subjects under the conditions of the previous experiment exhibit success in remote viewing independently of the feedback condition, we would then carry out a further experimental series to define more precisely the role played by feedback. In this case a subject would be asked to describe pictorial material presented by a distant slide projector. (We carried out such experiments in a pilot study and found them successful.)

The purpose of this new set of trials is to determine whether a subject can accurately describe material that is unknown, and remains unknown, to any person. To accomplish this result it is necessary to arrange for computer scoring of the trials. Each of 32 target slides will be dichotomized into five pairs of describable attributes such as indoors/outdoors, wet/dry, etc. These attributes constitute a five-bit binary code where each bit corresponds to the presence or absence of each of the target attributes. (The complete technique is described in the previous section on coding.) Such target description encoding allows automatic computer scoring of the subject's response to proceed as follows.

After the subject finishes his description of the target in the remote viewing experiment, an experimenter, who is blind to the target selected, would have the task of evaluating the description in terms of the five dichotomies, which would then be entered into a microcomputer by toggle switches. The computer would then compare and score his judgment of target attributes against the correct ones, registered on the slide by an appropriate light/dark bar code read by photodiodes. The total number of matches would be recorded automatically. After six such trials, the experimenters would read out the total number of correct matches. A perfect score would consist of 6 experiments times 5 bits, or 30 hits. A score of 20 hits would be the minimum to show statistical significance, and, if achieved, would constitute evidence for remote viewing in the absence of any conscious access to the target/response pair key. In the event that this experiment is successful, it would provide definitive and crucial evidence that

models of psychoenergetic processes based on precognitive feedback channels alone, such as those proposed by O. Costa de Beauregard,[16] are not correct.

An additional variation to be included is the presence or absence of an experimenter viewing the slides to determine whether knowledge of the target by some person enhances the remote viewing process.

The outcome of experiments of this type is important with regard to assessing the reliability of information obtained under conditions in which feedback is minimal. As a side benefit, the protocol as outlined can yield information as to resolution (depending on size of slide projection) and enhancement factors associated with the presence or absence of individuals knowledgeable of the target. Finally, the data obtained provide for evaluation of the feasibility of using slide targets as a medium for a practical communication system. If the use of slide targets is successful, a standard demonstration experiment would be developed so that the communications system could be observed by outside evaluation teams.

d. Tracking of Targets in Motion

It has been pointed out by several sources that some operators of fire-control radar displays can continue to make correct judgements even when their scope is "white" with chaff and jamming. The conjecture is that they either obtain subliminal information that the untrained observer cannot see, or that there is a paranormal component to their perception.

An attractive way to investigate this phenomenon with regard to the paranormal hypothesis would be to generate a CRT display showing clouds with a superimposed grid. An invisible target airplane can be programmed to circumnavigate the display in a randomly-determined manner. The task of the operator would be to activate a light-pen gun over the square where he senses the plane to be, at which time the plane's location is made visible for a short feedback interval. This computer-controlled game would test, record, and provide immediate feedback to the

user. If tracking of this nature is a learnable skill, the protocol of feedback and immediate reinforcement should allow learning to take place.

e. Measurement of Accuracy as a Function of Repetition Rate

The rate at which trials in an ESP experiment are conducted appears to strongly affect the success of the experiment. In our experience, the success of subjects increases in direct proportion to the time between experiments. From data including card guessing, remote viewing, and picture drawing experiments, the common finding suggests that if the targets are presented too rapidly in time, a temporal contamination of neighboring stimuli occurs. In the annals of psychical research this has been called displacement. A typical example is afforded by repetitious slide experiments in which a subject gives an excellent description of a remote slide that has not yet been illuminated, or a description of one which has been illuminated but not yet shown to the subject, thereby missing the real-time target. A corollary is that displacement phenomena must be inhibited for successful real-time psychoenergetic functioning to occur.

Tart has a theoretical explanation for this effect, which he draws from conventional physiology.[17] He calls this phenomenon "Trans-Temporal Inhibition," and offers the following explanation:

Trans-Temporal Inhibition

> "What I am postulating, then, is an active inhibition of the precognitively and post-cognitively gained information about immediate future and immediate past, in order to enhance the detectability of ESP information about real-time events. Since this inhibition extends over time, I have named this phenomenon trans-temporal inhibition.
>
> Except for the unusual features of extending over time rather than space, trans-temporal inhibition is analogous to a widely used information processing strategy in the nervous system called lateral inhibition. This is a general phenomenon of a highly stimulated receptor sending out inhibitory impulses to receptor endings laterally/spatially adjacent to it, thus suppressing their initially weaker output, unless they are also strongly stimulated by an appropriate stimulus. It amounts to an edge detection

process. To illustrate: If you press on your skin with a sharply pointed object, not only is the touch receptor immediately under the point strongly stimulated, but, because of the mechanical deformation of the skin, receptors laterally adjacent to the point are also stimulated, although less intensely. The neural impulses resulting at the first stage of detection, then, would be most intense immediately under the stimulated point, but fairly intense on each side of it, gradually tapering off, producing a neural signal pattern suggesting a blunt, rounded stimulating object, rather than a point. The most stimulated receptor under the point, however, sends out inhibitory impulses suppressing the weaker (less frequent) impulses from the laterally adjacent receptors, and so recovering a pattern indicating point stimulation further on in the nervous system. The phenomenon of trans-temporal inhibition, then, suggests that a generally useful information processing procedure is also operative for ESP."

In order to investigate this conjecture, the results of experimentation under way for other purposes would be analyzed for the displacement phenomenon as a function of inter-experiment temporal spacing.

2. Analysis

In our remote viewing experiments, the final output is typically a tape recording and a written transcript, in which the subject relates his perceptions and experiences with respect to the remote site that he is attempting to describe. It is becoming apparent to us, as experimenters, that some portions of a subject's output are more reliable than others. For example, when a subject describes something at the site as being very surprising to him, it can usually be found at the site. When the subject assigns a name to the site, or a specific function, it is usually incorrect. Similarly, when motion is perceived at the site, this perception is usually correct. In some instances, a change in the tone of voice of the subject is an indicator that the material being described is more (or less) likely to be correct.

In addition, certain descriptive aspects of remote sites are usually described correctly, such as whether they are indoors or outdoors, whether the light is bright or dim, or whether the outbound experimenters at the site are active or passive. These dichotomies have already been codified in preliminary attempts to quantify remote viewing for the purpose of sending messages.

A systematic analysis of transcripts and tapes could greatly increase the accuracy of information obtainable from this type of experiment, and therefore extensive transcript analysis could profitably be carried out on the data base generated to date. This could include such speculative procedures as voice stress analysis of the tapes.

3. Mechanisms

a. Theoretical Studies

To date, three basic physical models have been proposed to describe paranormal functioning on the basis of present theory or reasonable extensions of same. These are the ELF (extremely low frequency) electromagnetic hypothesis, the quantum correlation hypothesis, and the extradimensional hypothesis.

As discussed in Section I, the ELF hypothesis suggests that psychoenergetic processes are carried by electromagnetic waves in the frequency region below 1 kHz.[6-9] Experimental support for this hypothesis is claimed on the basis of lower-then-inverse-square attenuation, low bit rates, and ineffectiveness of ordinary electromagnetic shielding; factors (among others) apparently common to both ELF and psychoenergetic processes. The quantum correlation hypothesis stems from the recognition that a theory of reality compatible with quantum theory cannot require spatially separated events to be independent,[18-20] but must permit interconnectedness of distant events in a manner that is contrary to ordinary experience.[21,22] The extradimensional hypothesis is based on the ideas of Targ, Puthoff, and May (SRI), G. Feinberg (Columbia University), and E. Rauscher (University of California Lawrence Berkeley Laboratory) pertaining to the use of extra spatial and temporal dimensions to provide a space-time metric especially suitable for describing psychoenergetic processes.[23]

In the theoretical studies suggested below, we would provide a series of predictions around which experiments can be designed, and thus provide for the necessary differentiation among competing models for psychoenergetic mechanisms. Such work would be pursued by both SRI personnel and by consultant theoretical physicists; it will be collated by SRI.

Using the data base generated in past remote viewing experiments, SRI proposes to look for correlations between success/failure and time of day, geomagnetic storm activity, sun spot activity, and other naturally occurring phenomena. In particular, we would use standard statistical procedures to study correlation of remote sensing results with factors such as east-west asymmetry, geomagnetic disturbance indices, and diurnal variations, which are known to affect ELF and other propagation.

b. ELF Experiments

The objective of these experiments is to determine the extent to which the demonstrated remote viewing ability of an experienced subject is degraded by placing him in electrically shielded environments such as mu-metal chambers or submersibles. (Arrangements have been made with appropriate organizations to obtain the use of a deep sea submersible for this experiment.) It is anticipated that at least six experiments would be carried out in each environment of interest. These remote viewing experiments would be judged and evaluated statistically in accordance with the previously established procedures described earlier.

If a subject is able to perform remote viewing from such environments, we would conclude that electromagnetic radiation plays a negligible role in the process. If he is unable to produce statistically significant results under the shielded conditions, this would tend to support the ELF hypothesis. We would, however, have to check for the possible effects of psychological inhibition caused by the unusual settings. This would be accomplished by covertly degrading the shielding of the shielded room, or by attaching a wire to the submersible. If an otherwise successful subject were still unable to remote view, we could conclude that psychological factors rather than shielding degraded his performance. If, on the other hand, his ability were restored by the covert reduction of shielding, we would conclude that electromagnetic effects were involved.

The use of shielding with different characteristics allows differential testing of such factors as frequency dependence of the

phenomenon. Therefore, we would carry out remote viewing experiments using electromagnetic and magnetic shielding, such as thick-walled or mu-metal chambers (NASA Ames, Stanford University Physics Dept.) or the shielded room at the MIT Magnet Laboratory, as well as submersibles, for the purpose of obtaining further information pertaining to the ELF hypothesis, the hypothesis favored in the USSR for all psychoenergetic phenomena.

If it appears from the above work that ELF plays a part in remote viewing, we would then conduct a similar series of controlled and judged experiments with the subject in a high-intensity EM environment such as an electrical substation whose 60-Hz generator would act as a potential jamming noise source.

We also propose to use a portable ELF generator that would be taken to six remote target areas that are otherwise relatively free of ELF. At these sites, it would be determined in a random manner, blind to the subject, whether the generator is to be turned on or off. We would then make a statistical comparison of the remote viewing results. Thus, we would use ELF sources (i.e., signal generators) as targets in remote sensing, and use ELF sources for jamming the remote viewing environment, in controlled double-blind experiments.

c. Subject-Induced Equipment Perturbation Effects

The study of human/machine interactions as a psychoenergetic process has posed great difficulties for serious investigators. Among these difficulties are the combined facts that the reported effects tend to be small, and that the local environment has rarely been monitored for causes other than the proposed psychoenergetic ones. In addition, one finds that the strongest effects are reported as occurring with the most controversial and/or suspect subjects. Out of this collection of questionable experimentation (and often poor reporting) emerge, however, a few provocative experimental results that suggest that further careful examination may be worthwhile and possibly rewarding. Such studies would provide valuable data for assessing whether the area of subject-induced equipment perturbations constitutes a useful area in inquiry.

(1) Strain Gauge Experiments

As a result of technical contacts with Prof. John Hasted, Birkbeck College, University of London, during an Iceland Conference on Physics and Parapsychology, we have developed an interest in attempting to confirm his claim[24,25] that he has observed inelastic and elastic deformations of metal bars by some kind of remote human interaction. During these experiments the subjects are reported to cause effects without any physical contact with the metal.

In an effort to replicate Prof. Hasted's results, we have constructed an electrically shielded enclosure having more than 135 dB RF attenuation from 10 kHz to 10 MHz and plexiglass sides (to shield against air currents). Within this enclosure is the experimental system of resistive strain gauges attached to a thin metal bar. These are wired as a temperature-compensating bridge and connected to battery-operated amplifiers and recording instruments. At present we can detect changes in the length of the bar on the order of 500 angstroms and applied transverse forces of approximately 100 mg. To date, we have been successful in isolating and correcting several sources of artifact, and have obtained hours of artifact-free baseline operation. All of the data will be magnetically recorded for later computer analysis, and a simple stripchart record will provide immediate feedback to the subject of any changes in the bar. We are encouraged with the progress of artifact isolation, and we propose to begin to task subjects to attempt to perturb the isolated metal bar.

Should experimentation reveal genuine subject-induced perturbations, we propose to determine whether such effects can be used as a message-transmission device (remote telegraph).

(2) Random Number Generator Experiments

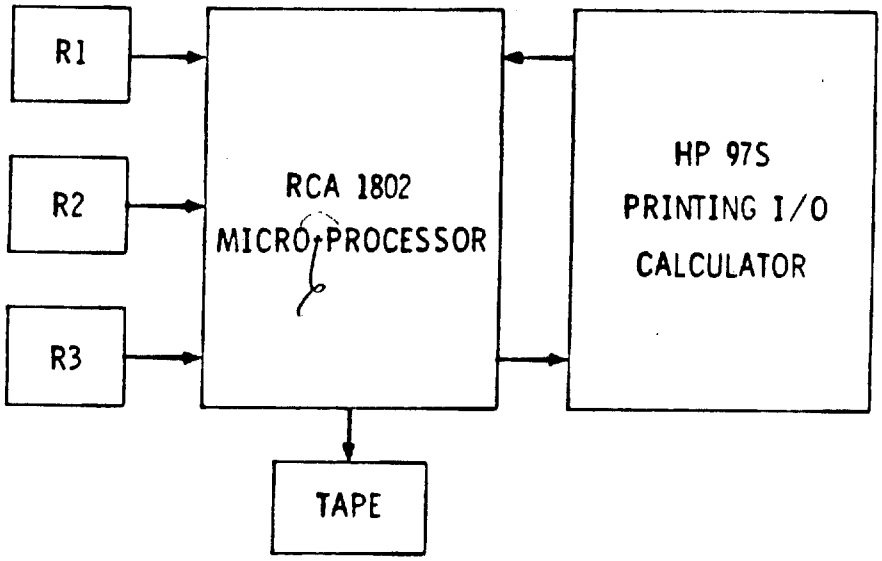
Another class of experiments that have been extensively reported are those that involve alleged human/machine interaction with electronic random-number generators. In these experiments, digital electronic noise derived either from a thermal noise source or from the decay of a radioactive material is monitored while a subject is

attempting to alter the statistical properties of the noise distribution. The usual protocol involves providing visual and audio feedback signals, proportional to various statistical parameters, to a subject who is asked in a biofeedback scenario to concentrate upon the feedback signals and to alter them in a prescribed way. To date, there have been 54 such experiments reported in the literature,[26] of which 35 report statistically significant effects, while one of these studies show similar departures from randomness during control runs without intended influence.

We are presently in the design stage of a microprocessor-based random-number generator. A block diagram of the system is shown in Figure 2. We plan to use three fundamentally different sources of random events to derive the digital electronic noise signal. The first of these is a diode designed by R. H. Haitz,[27] that is completely understood from both the quantum mechanical and solid state construction point of view. A second fundamentally different source of random events is to be derived from the decay of a single-transition beta emitter. Lastly, the entire system can be checked against a pseudorandom shift register, that constitutes a third source of random events. This latter has the property that a long string of bits appears random, yet once the shift register is reinitialized it produces the identical random sequence once again.

The instrument is under control of a microprocessor that records data on magnetic tape for later analysis, and controls a printing I/O statistical calculator that provides immediate results for feedback. Once the instrument is complete, it will be exhaustively tested for possible artifacts resulting from environmental conditions.

We propose to use this instrument first to attempt to confirm the existence of the claimed phenomenon, and, if it is confirmed, to investigate theoretical implications with regard to various modes of human/machine interaction. Assuming that an effect can be stabilized, this microprocessor-based system can easily be reprogrammed to utilize coding techniques (described earlier) to construct a "remote" telegraph communication system.



R1 = "HAITZ" NOISE DIODE

R2 = ELECTRON EMITTER - RADIO ACTIVE SOURCE

R3 = PSEUDO-RANDOM SHIFT REGISTER

FIGURE 2 RANDOM-NUMBER GENERATOR – BLOCK DIAGRAM

(3) Magnetometer Experiments

One of the first intentionally induced physical perturbation effects observed by SRI personnel was the apparent perturbation of a superconductor-shielded Josephson effect magnetometer by two subjects who performed successfully in remote viewing experiments.[28] We propose to carry out further experimentation with a sensitive Josephson junction cryomagnetometer, a commercial instrument manufactured by Superconducting Technology, Inc., Mountain, View, California (Model A201 magnetometer, employing an A401 SQUID sensor, A301 RF amplifier, and removable superconducting shield).

Experimentation with such instrumentation requires the following steps:

(1) Obtain calibration data in control runs to establish baseline performance of the magnetometer in the absence of any subject.

(2) Repeat above with various subjects present, but passive, to establish background of perturbation effects in the presence of subjects not engaging in volitional efforts to perturb magnetometer system.

(3) Carry out controlled experimental runs based on effort/non-effort periods being determined by random number generator to provide statistical control. Make multiple recordings to investigate "recorder only" effects, and conduct automated statistical analysis (FFT, spike train analysis, etc.) of the magnetometer output to determine the signature of subject-produced effects.

(4) If perturbation effects are observed, interposition of distance and shielding in a systematic way to determine dependence of these factors.

In addition to the possible use of sensitive instrumentation as targets for active perturbation efforts in, for example, a communication link, such study offers the potential for determining the use of such instrumentation as passive detectors of remote viewing phenomena ("intrusion detection").

C. Psychophysiological Correlates

1. Physiological Measures for Psi-Conducive States

In recent years, behavioristically oriented scientists have suggested that in addition to obtaining overt responses such as verbalizations or key presses from a subject, it should be possible to obtain objective evidence of psi activity by direct measurement of some physiological parameter of a subject, Kamiya, Lindsley, Pribram, Silverman, Walter, and others who came together to discuss physiological methods to detect ESP functioning, have suggested that a whole range of electroencephalogram (EEG) responses such as evoked potentials (EPs), spontaneous EEG, and the contingent negative variation (CNV) might be sensitive indicators of the detection of remote stimuli not mediated by usual sensory processes.[29]

An early experiment of this type is that of Douglas Dean at the Newark College of Engineering. In his search for physiological correlates of information transfer, he used the plethysmograph, which measures changes in the blood volume in a finger and is a sensitive indicator of autonomic nervous system functioning.[30] A plethysmographic measurement was made on the finger of a subject during telepathy experiments. In these tests a sender looked at randomly selected target cards consisting of names known to the subject, together with names unknown to him (selected at random from a telephone book). The names of the known people were contributed by the subject and were to be of emotional significance to him. Dean found significant changes in the chart recording of finger blood volume when the remote sender was looking at those names known to the subject as compared with those names randomly chosen.

Three other experiments using the physiological approach have now been published. The first work by Tart,[31] a later work by Lloyd,[32] and most recently the work by the authors of this document[33] all follow a similar pattern. Basically, a subject is closeted in an electrically shielded room while his EEG is recorded. Meanwhile, in another laboratory, a second person is stimulated from time to time, and the time of that stimulus is marked on the magnetic tape recording of the subject's EEG. The subject does not know when the remote stimulus periods are, as

compared with the nonstimulus periods. Evidence for systematic changes in EEG correlated with the remote stimuli are then sought.

All of these physiological measures might be used as a potential signaling channel for information transfer, but a more important application of this output would be as feedback to the subject, so that he could learn to recognize his own optimal state of mind for success in a psychoenergetic task.

2. Environmental Factors

a. Altered States of Consciousness: Special Environments

For the entire history of parapsychological research there has been keen interest in optimizing the physical and psychological conditions for a subject during an experiment. In the early part of this century, there was much interest in the use of hypnosis as a means of relaxing the subject, and suggesting to him that he would be successful in the task before him. This approach, although attractive to many investigators, never yielded convincing results indicating that subjects did better through the use of hypnosis then they might have done with ordinary relaxation.

In the last two decades there had been an interest in the use of various pharmacological agents with a view toward whether they would induce psi-conducive states. No evidence of enhancement emerged from these studies either. Some subjects could produce statistically significant results both in pharmacologically-altered and in normal states, and so there was no evidence that the altered state had anything to do with their success.

More recently there has been a great deal of interest in the so-called ganzfeld protocol, in which a subject is provided with presumably neutral sensory inputs. These are usually in the form of white noise through earphones, and uniform illumination filtered through ping-pong ball halves covering the eyes. The researchers at the Maimonides Hospital Parapsychology Laboratory have obtained consistent success with this kind of protocol over a period of several years. Thus, unlike the use of hypnosis and pharmacological agents, some evidence that this form of of environment control can be conducive to psychoenergetic functioning for some subjects.

Therefore, it is desirable to conduct experiments with trained, high-scoring subjects to examine the effects of other factors which might provide psychological conditions conducive to high-quality psychoenergetic functioning (e.g., sensory isolation, free-fall conditions in space, etc.).

b. Examine the Part Played by the Experimenter

From the work of Prof. Robert Rosenthal at Harvard it is clear that there is a strong difference in the outcome of some psychology experiments, depending on who conducts the experiment. This so-called experimenter effect has been the subject of investigation for the past 15 years in an attempt to find means to objectify some of the principal findings of conventional perceptual and behavioral psychology. We are not suggesting that this experimenter effect in psychology is due to paranormal influences, but rather that some of the inability to replicate ESP experiments of one laboratory, when the experiments are transferred to another laboratory, might be due to subtle experimenter effects of the type known to occur in psychology and behavior experiments in general.

We consider it important to find out if the success or failure of parapsychology experiments relate to the experimenter effect through interpersonal interaction, subliminal cueing, or some as-yet uncataloged factor.

3. Educational Procedures

a. Screening

Conversations with East Bloc researchers, and recent information from Soviet researcher I.M. Kogan indicate that the USSR has established a significant nationwide testing program to identify psychically gifted young people. It is now generally agreed that psychic functioning is an innate or latent ability, somewhat similar to musical talent. That is, all people have it to some degree, but there is a wide range of abi,ities from the psychically tone deaf, to the

virtuoso performer. It would be the goal of a screening program to locate and recruit the most psychically talented individuals available, both to obtain a measure of the range of abilities that exists, and also to make use of these abilities to further increase our understanding of the phenomenon.

(1) Explore Training Techniques with Children, the Blind, and Other Special Subjects

Although there is strong laboratory evidence for psychoenergetic functioning in a great number of individuals, psychic functioning is not yet widely accepted and utilized in the society at large. One conjecture for the reason that there is not more day-to-day evidence of this ability is that it is a forbidden activity, largely suppressed in our society. It is further conjectured that psychic functioning may be easier to elicit from children, who have not yet "unlearned" the use of this otherwise natural ability. Therefore, we would anticipate that part of any program effort would be directed toward work with children in order to test this hypothesis.

Similarly, if the hypothesis of societal inhibition against the use of psychic functioning is correct, a group of adults likely to have overcome it to some degree would be the blind, since it would be greatly advantageous to them to have additional means of gaining information about their environment. We have carried out a remote sensing experiment with one blind individual and found him to be an excellent subject.

In addition, work with the blind may provide an opportunity to observe underlying parameters of paranormal perception at a more primary level, since individuals lacking sight may be less conditioned by the visual learning modalities characteristic of our society.

We consider that investigation with both children and blind subjects would constitute a valuable addition to any continuing effort to screen the population for high-performance subjects.

(2) Distance Experiments with Identical Twins

Identical twins have become an enigma to modern psychoenergetic research. Although there is copious anecdotal material verifying the existence of a paranormal rapport between distantly separated twins, this alleged linkage has resisted laboratory confirmation.

Identical twins often express the opinion that they have a sensitivity to the feelings, dangers and traumas experienced by each other, and many such instances have been well documented in the parapsychological literature. However, it is interesting that these same twins tend to perform at chance levels when tested with standard ESP testing materials, such as cards and pictures. In our opinion meaningful use can be made of the unique psychological and physiological relationship existing between twins, by having them participate in experiments of the remote viewing type in which there is a high yield of success generally. If an exceptionally high degree of success with twins taking part in remote viewing experiments was forthcoming, perhaps new measures of the limits of resolution could be obtained from such an effort.

It appears that the lack of accuracy in the remote viewing protocol comes not so much from the lack of perception by the receiver, but rather from his or her ability to render the preconscious images without distortion. It is possible that twins share a common fund of such images and image-processing mechanisms, and therefore could provide increased resolution and analytic content, as compared with relative strangers who typically make up the remote viewing duo.

b. Training

(1) Training in Perceptual Tasks Paralleling Ordinary Perception

We have in our laboratory carried out a series of communication experiments involving the transmission, from one laboratory to another, of simple shapes (e.g., T, O, Δ), which also were of different colors for each shape. These tests were initiated in an effort to assess reports of Soviet work in this area, which include

the transmission of decimal numbers via a psychoenergetic channel, with a claimed yield of 105 out of 135 decimal digits 0-9 ($p \sim 10^{-77}$).[34]

The communications series was designed to determine whether a gradient series of perception tasks that mimic the known development of ordinary perception would be useful in the development of paranormal perception. The decision to follow such a protocol was derived from data indicating that the laws of paranormal perception are congruent with, rather than skew to, the laws that govern ordinary perception, especially under conditions of subliminal presentation. The particular question examined was whether a specific perceptual orientation process known to hold in ordinary perception of color, would hold in the case of paranormal perception as well. The perceptual process of interest was the well-documented scale of increasing sensitivity to color tones. Cross-cultural studies of 98 separate linguistic stocks indicate that perception of color tones in the environment begins with discrimination first of black and white (dull/bright); then red is identified as a color; then yellow followed by green or green followed by yellow; then blue; brown; and finally purple, pink, orange, and grey.[35]

With the hypothesis that a similar gradient is followed in the development of paranormal perception, subjects were asked to differentiate among simple remote color card targets first on the basis of the dichotomy dull/bright, then with regard to shape, and only finally with regard to color. Specifically, subjects were encouraged to reject premature mental discrimination processes based on color recognition, which, by the hypothesis under test, we would assume to be imaginative overlay from the already highly developed ordinary perceptual modes.

Numerous data were gathered with subjects who were experienced remote viewers. Analysis of the data, which shows learning on both cases, provides initial support for the hypothesis that progress in paranormal perception can be made on the basis of training drills designed from what is known about ordinary perception.

The purpose of this kind of training is the development of excellent and reliable paranormal perception of analytic and other alphanumeric types of target material.

Two extensions of this work are proposed: (1) Novice, as opposed to experienced, subjects will be tested on the protocol established above to determine whether they also show improvement in remote perception skills; and (2) additional protocols based on factors known to be important in ordinary perception will be designed and evaluated by further testing with experienced subjects.

(2) Training in Abstract Targeting, Including Geographical Coordinates

To date, two subjects have unmistakably demonstrated their ability to describe distant locations, given only the map coordinates (latitude and longitude) of a target site. Other subjects have attempted similar tasks with mixed results.

One notable difference between the two groups is that the successful group ran through practice training procedures involving ~100 sites taken from an ordinary atlas. Therefore, it is proposed that a similar procedure be applied with new subjects to evaluate whether such a procedure might result in the development of a training protocol of general use. Should improvement be forthcoming on this basis, novice subjects would also be tested and evaluated utilizing the same protocols.

Additional variations on the theme of abstract targeting would include targeting on the basis of pictures or maps of the target site (with and without key elements missing).

The goal of these efforts is to evaluate potential training protocols of wide applicability. Should such a program be successful, it would eliminate our dependence on a select group of naturally gifted individuals, a group that is inadequate in number for large-scale exploration of the field's potentialities.

IV PRIORITIES AND RECOMMENDATIONS

Based on our own past six years of research, and the decades of investigation by other scientists, we conclude that present evidence strongly indicates the existence of some sort of paranormal or psychoenergetic perceptual channel. By paranormal perception we mean the response of an individual to a stimulus presented to no known sense, or presented to a known sense by a currently unknown modality.

The two underlying goals that must be attained for the eventual utilization of this phenomenon are reliability and understanding, and the recognition that it is necessary to have both in order to have either.

We recommend that the principal objective of any new research activity in this area should be the development of the most reliable possible communication link, either between two individuals or between a person and an object, such as a thought-controlled switch. Only through achieving a system reliability of perhaps upwards of 80% can the physical and psychological factors controlling paranormal perception be determined.

To accomplish these objectives, we suggest that the highest-priority tasks to be carried out are those that involve optimizing the experimental protocols, and the training of subjects to reach excellence of performance. In addition, screening procedures must be established to enlarge the populations from which subjects are drawn, to allow us to find additional gifted individuals for participation in the experimental program.

Finally, we recommend that SRI, as a major contractor in this area, serve a dual function: (1) carry out the major portions of the contracted R&D efforts; and (2) host inter-agency and inter-contractor conferences. For day-to-day update, a teletype terminal would be placed at contractor and sponsor locations so that teleconferencing by computer can take place on a continual basis. Such computer teleconferencing provides the benefits of a message center that can be

accessed at any time, in addition to multi-party teleconferencing. Teleconferencing programs of the type used in the DARPA net or Planet system can be supplied by SRI.

For more formal inter-contractor conferences, SRI would follow procedures similar to those used on the ARPA-sponsored SECEDE and TEALWING programs, and the ABMDA-sponsored HAPREX program, wherein SRI hosts meetings of scientists brought together to advise DoD personnel on technological advances of potential strategic significance.

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